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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/588,008	06/06/2000	Sam Yang	M4065.0210/P210	9015
24998	7590	03/11/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			TRINH, HOA B	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	

2814

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/588,008

Applicant(s)

YANG ET AL.

Examiner

Vikki H Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31, 97 and 98 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31, 97 and 98 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

It is well settled that the law of anticipation does not require that the reference teach what appellant is teaching or has disclosed, but only that the claims on appeal "read on" something disclosed in the reference, i.e., all limitations of the claims are found in the reference. See *Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1083). Moreover, it is not necessary for the applied reference to expressly disclose or describe a particular element or limitation of a rejected claim word for word as in the rejected claim so long as the reference inherently discloses that element or limitation. See, for example, *Standard Havens Products Inc. v. Gencor Industries Inc.*, 953 F.2d 1360, 21 USPQ2d 1321 (Fed. Cir. 1991).

2. Claims 1-31, 98 are rejected under 35 U.S.C. 102(e) as being anticipated by Narwankar et al. (6,475,854)

Narwankar et al. (6,475,854) discloses memory cell capacitor structure 650 in a semiconductor device including:

As to claims 1, 23, a memory device having a bottom conducting layer 605, a dielectric layer 606 over the bottom conducting layer, a top conducting layer 608 and annealing the entire

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top conducting layer 608 comprising an oxygen permeable material (col. See Table 1 and figure 6e, col. 1, lines 60-65).

As to claims 2-3, 15, wherein the bottom conducting layer 605 is formed of a metal material layer selected from a "noble" metal group, i.e. Pt. See col. 10 lines 20-41.

As to claim 4, the bottom layer 605 is formed from a noble metal/metal alloy such as Ru, Pt, Ru, TiN, Ta₂O₅. (Table 1)

As to claims 5-8, 17-28, wherein the bottom conducting layer 605 is formed of a conducting metal oxide, metal nitride (i.e., Pt (noble metal), Titanium nitride, PtRh, silicide). (See table 1).

As to claim 9, the bottom layer is on top of the oxygen barrier 606. (see figure 6e, col. 10, lines 31-35)

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As to claim 10, the dielectric layer 606 is a dielectric metal oxide layer. (see column 10, lines 24-35)

As to claims 11-14, the dielectric layer is a dielectric metal oxide layer with high dielectric constant that falls between 7-300, i.e. BST or SBT. See col. 10, lines 24-35.

As to claim 16, the top conducting layer 615 may be formed of a non-oxidizing metal permeable to oxygen. See col. 11, lines 39-50, and Table 1.

As to claims 24-25, the oxygen annealed layer 615 is one annealed in the presence of oxygen and/or oxygen mixture (see Table 1).

As to claim 26, the annealed top layer 615 is a remote plasma enhanced annealed top layer (See table I, col. 13).

As to claim 27, the annealed top layer is a plasma enhanced annealed top layer (See table I, col. 13).

As to claim 28, the annealed top layer is an ultraviolet light annealed top layer (See table I, col. 13, fig. 9b).

As to claim 29, the capacitor is a stacked capacitor. See column 1, line 27).

As to claim 30, an access transistor connected to the capacitor. See col. 1, lines 23-30.

As to claim 31, the capacitor is a DRAM cell. (See column 1, line 21).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narwankar et al. '854 in view of Li et al. (6,489,199).

Narwankar et al. '854 discloses the invention substantially as claimed. However, Narwankar et al. '854 does not explicitly state that the bottom layer is formed from tungsten nitride. (See Table 1).

Li et al. (6,489,199) discloses a capacitor having top layer 192, a dielectric layer 191, and a tungsten nitride bottom layer 187. See figure 217 and column 11, lines 32-34.

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Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Narwankar et al. '854 with the tungsten nitride bottom, as taught by Li et al., so as to prevent diffusion from adjacent material. See Li et al., column 1, lines 43-45.

Response to Arguments

1. Applicant's argument is moot in view of the new rejection above

Conclusion

3. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached Mon-Tuesday, Thurs-Friday, 7:30 AM - 6:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705.

Vikki Trinh,
Patent Examiner
AU 2814

Wael Fahmy
SEP 28 '04